

Remarks

Favorable reconsideration of this application, in view of the above amendments and in light of the following remarks and discussion, is respectfully requested.

Claims 2, 4, 6, 7, and 9 are currently pending in the application; Claims 2, 6, and 7 having been amended, and Claims 3, 5, 8, 10, and 12-22 having been canceled without prejudice or disclaimer, by way of the present response.

In the outstanding Office Action Applicants were required under 37 C.F.R. § 1.105 to show how features of Claim 6 read on the elected species; the drawings were objected to under 37 C.F.R. § 1.83(a); Claims 2, 4, 6, 7, 9, and 21 were rejected under 35 U.S.C. § 112, second paragraph; Claims 2, 4, 6, 7, 9, and 21 were rejected under 35 U.S.C. § 112, first paragraph; Claims 2, 6, 7, and 21 were rejected under 35 U.S.C. § 102(a) as being anticipated by Japanese Publication No. 2002-040182 to Yamada et al. (Yamada); Claims 2, 6, 7, and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,232,655 to Verdier (Verdier '655); Claims 2, 6, 7, and 21 were rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 6,226,343 to Frederickson et al. (Frederickson); Claims 2, 4, 6, 7, 9, and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,606,583 to Verdier (Verdier '583) or U.S. Patent No. 4,668,469 to Widener; Claims 2, 6, 7, and 21 were rejected under 35 U.S.C. § 102(a) as being anticipated by Applicants' Prior Art Figures 2A and 2B; and Applicants were requested to submit information under 37 C.F.R. § 1.105.

As stated above Applicants were required under 37 C.F.R. § 1.105 to show how features of Claim 6, including first and second drain holes and their relationship to a spot facing hole and a hole at a distal end, read on the elected species. In response, Applicants respectfully assert that the requirement has been mooted by the amendment of Claim 6 so as not to recite first and second drain holes. Notwithstanding the above discussion, by way of

further explanation, Applicants respectfully assert that the claimed features recited in amended Claim 6 of a drain hole extending in a longitudinal direction from a spot facing hole of a seat to a distal end are understood to read on the elected species (species G) of the elected invention (group I). Applicants respectfully assert that the originally filed drawings, including Figures 9B and 11, show non-limiting examples of a drain hole 15, a spot facing hole 18, a seat 16, and a drain hole distal end 25.

As stated above the drawings were objected to under 37 C.F.R. § 1.83(a) as not showing every feature of the invention specified in Claims 6 and 21. In response, Applicants respectfully assert that the requirement has been mooted by the above-discussed amendment of Claim 6 so as not to recite first and second drain holes, and the cancellation of Claim 21. Thus, Applicants respectfully request that the objection to the drawings be withdrawn.

As stated above Claims 2, 4, 6, 7, 9, and 21 were rejected under 35 U.S.C. § 112, second paragraph. In response, Applicants have amended Claims 2, 6, and 7 so as not to be vague, indefinite, incomplete, or poorly phrased; have amended Claims 2 and 6 to positively recite a bottom nozzle, a top nozzle, and a plurality of control rod guide tubes, as well as to provide antecedent basis for the features of the claims; and have amended Claim 6, as discussed above, so as not to recite first and second drain holes. Applicants have further canceled Claim 21. Thus, Applicants respectfully request that the rejection of Claims 2, 4, 6, 7, and 9 under 35 U.S.C. § 112, second paragraph, be withdrawn.

As stated above, Claims 2, 4, 6, 7, 9, and 21 were rejected under 35 U.S.C. § 112, first paragraph. In response, as discussed above, Applicants have amended Claim 6 so as not to recite first and second drain holes; have amended Claims 2 and 6 to positively recite a bottom nozzle, a top nozzle, and a plurality of control rod guide tubes; and have canceled Claim 21. Applicants respectfully assert that other elements of the invention, which are not recited in the claims, are neither necessary nor essential to the practice of the invention,

notwithstanding the discussion of these elements in the specification or the illustration of these elements in the drawings. Thus, Applicants respectfully request that the rejection of Claims 2, 4, 6, 7, and 9 under 35 U.S.C. § 112, first paragraph, be withdrawn.

As stated above Claims 2, 6, 7, and 21 were rejected under 35 U.S.C. § 102(a) as being anticipated by Yamada. Claims 2, 6, 7, and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by Verdier '655. Claims 2, 6, 7, and 21 were rejected under 35 U.S.C. § 102(a) as being anticipated by Frederickson. Claims 2, 4, 6, 7, 9, and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by Verdier '583 or Widener. Claims 2, 6, 7, and 21 were rejected under 35 U.S.C. § 102(a) as being anticipated by the Prior Art Figures. Applicants respectfully assert that the rejections of Claim 21 have been mooted by the cancellation of the claims, and that the amendments to the claims have overcome the rejections of Claims 2, 4, 6, 7, and 9 for the following reasons.

The present invention is directed to a fuel assembly. Independent Claims 2 and 6 recite a bottom nozzle configured to be disposed on a lower plate of a nuclear reactor. A top nozzle includes a hold down spring configured to urge the bottom nozzle toward the lower plate. A plurality of control rod guide tubes is configured to guide control rods, passed through the top nozzle toward the lower plate. A thimble screw is locked to the bottom nozzle at a seat with a rotation preventive pin to connect the control rod guide tubes to the bottom nozzle. The thimble screw includes a drain hole. The drain hole extends in a longitudinal direction from a spot facing hole of the seat to a distal end. The drain hole is configured to receive coolant supplied into the drain hole from the spot facing hole toward the distal end while the nuclear reactor operates and to receive coolant supplied into the drain hole from the distal end toward the spot facing hole during a scram mode. Independent Claim 2 further recites a coolant collision portion at a drain hole side of the rotation preventing pin against which the coolant flowing from the distal end toward the spot facing

hole collides in order to increase pressure drop of the coolant during the scram mode.

Independent Claim 6 recites the drain hole has a large inner diameter portion at a distal end side and a small inner diameter portion at a seat side, the spot facing hole disposed on the seat side.

Regarding the rejection of independent Claim 2, Yamada is directed to a thimble screw for a reactor fuel assembly. Applicants respectfully assert that Yamada does not teach or render obvious, however, the claimed features of a coolant collision portion at a drain hole side of a rotation preventing pin against which coolant flowing from a distal end toward a spot facing hole collides in order to increase pressure drop of the coolant during a scram mode, as recited in independent Claim 2. Specifically, Applicants respectfully assert that Yamada does not show a coolant collision portion against which coolant collides during a scram mode. Thus, Applicants respectfully request that the rejection of independent Claim 2 under 35 U.S.C. § 102(a) in view of Yamada be withdrawn.

Verdier '655 is directed to a nuclear fuel assembly. Applicants respectfully assert that Verdier '655 does not teach or render obvious, however, the claimed features of a coolant collision portion at a drain hole side of a rotation preventing pin against which coolant flowing from a distal end toward a spot facing hole collides in order to increase pressure drop of the coolant during a scram mode, as recited in independent Claim 2. Specifically, Applicants respectfully assert that Verdier '655 does not show a coolant collision portion against which coolant collides during a scram mode. Thus, Applicants respectfully request that the rejection of independent Claim 2 under 35 U.S.C. § 102(b) in view of Verdier '655 be withdrawn.

Frederickson is directed to a water rod in a fuel assembly of a boiling water nuclear reactor. Applicants respectfully assert that Frederickson does not teach or suggest, however, the claimed features of a coolant collision portion at a drain hole side of a rotation preventing

pin against which coolant flowing from a distal end toward a spot facing hole collides in order to increase pressure drop of the coolant during a scram mode, as recited in independent Claim 2. Thus, Applicants respectfully request that the rejection of independent Claim 2 under 35 U.S.C. § 102(a) in view of Frederickson be withdrawn.

Widener is directed to a fastener locking device for attaching a guide thimble to a fuel assembly bottom nozzle. Applicants respectfully assert that Widener does not teach or render obvious, however, the claimed features of a coolant collision portion at a drain hole side of a rotation preventing pin against which coolant flowing from a distal end toward a spot facing hole collides in order to increase pressure drop of the coolant during a scram mode, as recited in independent Claim 2. Thus, Applicants respectfully request that the rejection of independent Claim 2 under 35 U.S.C. § 102(b) in view of Widener be withdrawn.

Verdier '583 is directed to a guide tube for a nuclear fuel assembly. Applicants respectfully assert that Verdier '583 does not teach or render obvious, however, the claimed features of a coolant collision portion at a drain hole side of a rotation preventing pin against which coolant flowing from a distal end toward a spot facing hole collides in order to increase pressure drop of the coolant during a scram mode, as recited in independent Claim 2. Thus, Applicants respectfully request that the rejection of independent Claim 2 under 35 U.S.C. § 102(b) in view of Verdier '583 be withdrawn.

Applicants respectfully assert that the Prior Art Figures also do not teach or render obvious the claimed features of a coolant collision portion at a drain hole side of a rotation preventing pin against which coolant flowing from a distal end toward a spot facing hole collides in order to increase pressure drop of the coolant during a scram mode, as recited in independent Claim 2. Thus, Applicants respectfully request that the rejection of independent Claim 2 under 35 U.S.C. § 102(a) in view of the Prior Art Figures be withdrawn.

Applicants respectfully assert that the outstanding grounds of rejection of independent Claim 2 have been overcome for the above reasons. Thus, Applicants respectfully request the allowance of independent Claim 2.

Regarding the rejection of independent Claim 6, Yamada is directed to a thimble screw for a reactor fuel assembly. Applicants respectfully assert that Yamada does not teach or render obvious, however, the claimed features of a thimble screw including a drain hole having a large inner diameter portion at a distal end side and a small inner diameter portion at a seat side, a spot facing hole disposed on the seat side, as recited in independent Claim 6. Rather, Applicants respectfully assert that Yamada at most shows a drain hole having a large inner diameter portion at a seat side where a spot facing hole is disposed, and a small inner diameter portion at a distal end, which is opposite to the claimed locations of the large and small inner diameter portions. Thus, Applicants respectfully request that the rejection of independent Claim 6 under 35 U.S.C. § 102(a) in view of Yamada be withdrawn.

Verdier '655 is directed to a nuclear fuel assembly. Applicants respectfully assert that Verdier '655 does not teach or render obvious, however, the claimed features of a thimble screw including a drain hole having a large inner diameter portion at a distal end side and a small inner diameter portion at a seat side, a spot facing hole disposed on the seat side, as recited in independent Claim 6. Rather, Applicants respectfully assert that the hole 30 of Verdier '655 does not have the specified large and small inner diameter portions, as recited in the claim. Thus, Applicants respectfully request that the rejection of independent Claim 6 under 35 U.S.C. § 102(b) in view of Verdier '655 be withdrawn.

Frederickson is directed to a water rod in a fuel assembly of a boiling water nuclear reactor. Applicants respectfully assert that Frederickson does not teach or suggest, however, the claimed features of a fuel assembly including the specified bottom and top nozzles, plurality of control rod guide tubes, and thimble screw, as recited in independent Claim 6.

Thus, Applicants respectfully request that the rejection of independent Claim 6 under 35 U.S.C. § 102(a) in view of Frederickson be withdrawn.

Widener is directed to a fastener locking device for attaching a guide thimble to a fuel assembly bottom nozzle. Applicants respectfully assert that Widener does not teach or render obvious, however, the claimed features of a thimble screw including a drain hole having a large inner diameter portion at a distal end side and a small inner diameter portion at a seat side, a spot facing hole disposed on the seat side, as recited in independent Claim 6. Rather, Applicants respectfully assert that Figure 2 of Widener does not show the void in the fastener locking device 62 having the specified large and small inner diameter portions, as recited in the independent claim. Thus, Applicants respectfully request that the rejection of independent Claim 6 under 35 U.S.C. § 102(b) in view of Widener be withdrawn.

Verdier '583 is directed to a guide tube for a nuclear fuel assembly. Applicants respectfully assert that Verdier '583 does not teach or render obvious, however, the claimed features of a fuel assembly including the specified bottom and top nozzles and thimble screw, as recited in independent Claim 6. Thus, Applicants respectfully request that the rejection of independent Claim 6 under 35 U.S.C. § 102(b) in view of Verdier '583 be withdrawn.

Applicants respectfully assert that the Prior Art Figures also do not teach or render obvious the claimed features of a thimble screw including a drain hole having a large inner diameter portion at a distal end side and a small inner diameter portion at a seat side, a spot facing hole disposed on the seat side, as recited in independent Claim 6. Rather, Applicants respectfully assert that the Prior Art Figures do not show the void in the thimble screw 14 having the specified large and small inner diameter portions, as recited in the independent claim. Thus, Applicants respectfully request that the rejection of independent Claim 6 under 35 U.S.C. § 102(a) in view of the Prior Art Figures be withdrawn.

Applicants respectfully assert that the outstanding grounds of rejection of independent Claim 6 have been overcome for the above reasons. Thus, Applicants respectfully request the allowance of independent Claim 6.

Applicants respectfully assert that Claims 4, 7, and 9 are allowable for the same reasons as independent Claims 2 and 6 from which they depend, as well as for their own features. Thus, Applicants respectfully request that the rejections of dependent Claims 4, 7, and 9 be withdrawn, and therefore respectfully request the allowance of dependent Claims 2, 7, and 9.

Notwithstanding the above discussion, Applicants respectfully assert that the claims recite further features that are not taught or suggested by the reference of record in the application. By way of specific non-limiting examples, Applicants respectfully assert that the claimed features recited in dependent Claim 7 of a thimble screw including a coolant collision portion provided at a seat, against which coolant flowing from a distal end toward a spot facing hole collides during the scram mode, are novel and unobvious. Specifically, Applicants respectfully assert that none of Yamada, Verdier '655, Frederickson, Verdier '583, Widener, or the Prior Art Figures, whether taken alone or in combination, teach or render obvious these features. Thus, Applicants respectfully assert that the foregoing provides alternate ground for the indication of allowable subject matter in dependent Claim 7, as well as Claim 9 depending therefrom.

As stated above Applicants were requested to submit information under 37 C.F.R. § 1.105. In response, Applicants respectfully assert that any information that has not yet been made of record in the application is unknown or is not readily available.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in

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condition for formal Allowance. A Notice of Allowance for Claims 2, 4, 6, 7, and 9 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

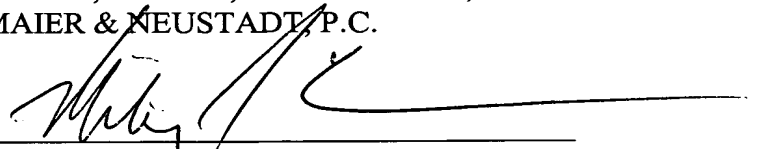
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